a wavelength of 520 nm shown in **FIG. 13**. An n-type cladding layer **61** made of GaN, an active layer **62** made of GaInN, a p-type cladding layer **63** made of AlGaN and a p-type contact layer **64** made of GaN were formed by MOVPE method on the epitaxial substrate **10**. After partially exposing the n-type cladding layer **61** by dry etching, the p-side electrode **65** and the n-side electrode **66** were formed by electron beam vapor deposition, thereby to obtain the light emitting diode **6**.

[**0142**] The light emitting diode showed an external quantum efficiency about 1.5 times higher than that of a light emitting diode of similar structure made by using an epitaxial substrate having such a structure as the heterojunction interface of the light emitting device structure is perpendicular on the C-plane sapphire substrate.

Example V

[**0143**] The epitaxial substrate **10** was used to make a laser diode oscillating at a wavelength of 400 nm shown in **FIG. 14**. An n-type contact layer **701** made of GaN, an n-type cladding layer **702** made of AlGaN, an n-type guide layer **703** made of GaN, an active layer **704** made of GaInN, a p-type guide layer **705** made of GaN, a block layer **706** made of AlGaN, a p-type cladding layer **707** made of AlGaN and a p-type contact layer **708** made of GaN were formed by MOVPE method on the epitaxial substrate **10**. After exposing the n-type contact layer **701** by dry etching, the p-type cladding layer was exposed to form a ridge structure. An insulation layer **709** was formed from SiO_2 so as to cover the side wall of the ridge structure, and the p-side electrode **710** and the n-side electrode **711** were formed by electron beam vapor deposition, thereby to obtain the laser diode **7**.

[**0144**] The laser diode showed threshold current lower than that of a device made by using an epitaxial substrate having such a structure as the heterojunction interface is perpendicular to the C axis of the prior art.

Example VI

[**0145**] The epitaxial substrate **10** was used to make a field effect transistor **8** shown in **FIG. 15**. A channel layer **81** made of GaN and a barrier layer **82** made of AlGaN were formed successively by the MOVPE method. After carrying out isolation of device, a source electrode **83**, a drain electrode **84** and a gate electrode **84** were formed by electron beam vapor deposition, thereby to obtain the field effect transistor **8**.

[**0146**] Current did not flow between the source electrode **83** and the drain electrode **84** when the gate bias was zero. When +1 V of bias voltage was applied, current of 0.1 A/mm flowed. Thus the enhancement type operation that had been impossible in the past was obtained.

Example VII

[**0147**] In Examples III through VI, after growing the first layer **13** having the condition of crystallinity such as the irregularity **13***a* described above, the second layer was grown thereon without taking sample out of the semiconductor growing apparatus. In Example VII, in contrast, the second layer **24** made of GaN was grown after growing the first layer and taking it out of the semiconductor growing apparatus and checking the irregularity **13***a*.

[**0148**] RMS surface roughness of the epitaxial substrate **10**, density of threading dislocations and density of stacking faults showed similar values as those in Example III-1, even when the second layer **24** was grown after once taking out the sample. The light emitting diode **6** shown in **FIG. 13**, the laser diode **7** shown in **FIG. 14** and the field effect transistor **8** shown in **FIG. 15** were made similarly to Example III through VI, respectively. Thus the semiconductor devices having characteristics similar to those of Example III through VI were obtained.

Example VIII

[**0149**] In Examples III through VII, the first layer **23** having the condition of crystallinity such as the irregularity **23***a* was grown. In Example VIII, in contrast, after growing the first layer, the sample was taken out of the semiconductor growing apparatus and the first layer was intentionally processed with dry etching to obtain the surface irregularity **23***a,* and then the second layer was grown.

[**0150**] RMS surface roughness of the epitaxial substrate **10**, density of threading dislocations and density of stacking faults showed similar values as those in Example III-1, even when the second layer **24** was grown after once taking out the sample and intentionally processing the first layer to obtain the surface irregularity **23***a*. The light emitting diode **6** shown in **FIG. 13**, the laser diode **7** shown in **FIG. 14** and the field effect transistor **8** shown in **FIG. 15** were made similarly to Example III through VI, respectively. Thus the semiconductor devices having characteristics similar to those of Examples III through VI were obtained.

Example IX

[**0151**] In Examples III through VIII, the second layer **24** was grown from GaN. In Example IX, in contrast, the second layer **24** made of $Al_{0.2}Ga_{0.8}N$ was grown after growing the first layer **23** made of $Al_{0.5}Ga_{0.5}N$ so as to obtain the surface irregularity **23***a* described above.

[**0152**] RMS surface roughness of the epitaxial substrate **10**, density of threading dislocations and density of stacking faults showed similar values as those in Example III-**1**, also when the second layer **14** made of $Al_{0.2}Ga_{0.8}N$ was grown. The light emitting diode **6** shown in **FIG. 13**, the laser diode **7** shown in **FIG. 14** and the field effect transistor **8** shown in **FIG. 15** were made similarly to Example III through VI, respectively.

[**0153**] The devices had other layers made of GaN (the n-type cladding layer **61** in the case of the light emitting diode, the n-type cladding layer **71** in the case of the laser diode and the channel layer **81** in the case of the field effect transistor) formed on the second layer **24**.

[**0154**] Thus the semiconductor devices having characteristics similar to those of Example III through VI were obtained.

Example X

[**0155**] While the base layer **22** was used in Examples III through IX, the first layer **23** was grown directly on the R-plane sapphire substrate **21** without using the base layer **22** in this example.

[**0156**] First, the first layer made of AlN was grown directly on the R-plane sapphire substrate **21** by the MOVPE